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JAPANESE

LEGAL STATUS

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PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-315985

(43)Date of publication of application : 29.10.2002

(51)Int.Cl.

D06F 23/06

D06F 37/08

D06F 39/04

(21)Application number :

2001-122267

(71) Applicant :

SANYO ELECTRIC CO LTD

(22)Date of filing :

20.04.2001

(72)Inventor :

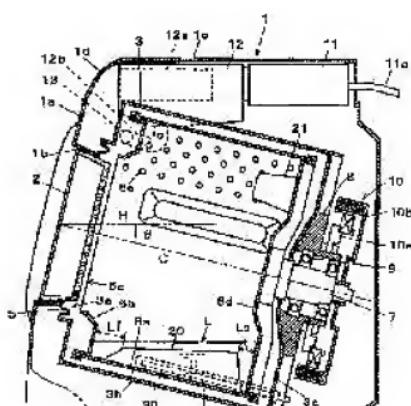
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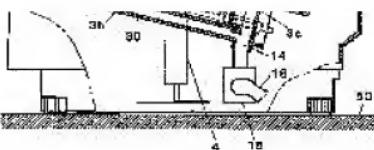
(54) DRUM-TYPE WASHING MACHINE

(57)Abstract:

PROBLEM TO BE SOLVED: To solve uneven washing by accelerating agitation of laundry in a drum-type washing machine with an inclined drum.

SOLUTION: A main baffle 20 provided in the internal circumferential face of a trunk part 6a of the drum 6 is formed low in the front part and high in the rear part so that its top surface becomes approximately horizontal. An auxiliary baffle 21 projecting frontward is provided in the rear surface plate 6d of the drum 6. In washing and rinsing operation, though the laundry is deviated in the rearward side by the inclination of the drum 6, the rear part of the main baffle 20 and the auxiliary baffle 21 having the sufficient heights can sufficiently agitate a large quantity of the laundry so as to hardly cause uneven washing.





JAPANESE

[JP,2002-315985,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM EXAMPLE DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

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CLAIMS

[Claim(s)]

[Claim 1] An outer tub.

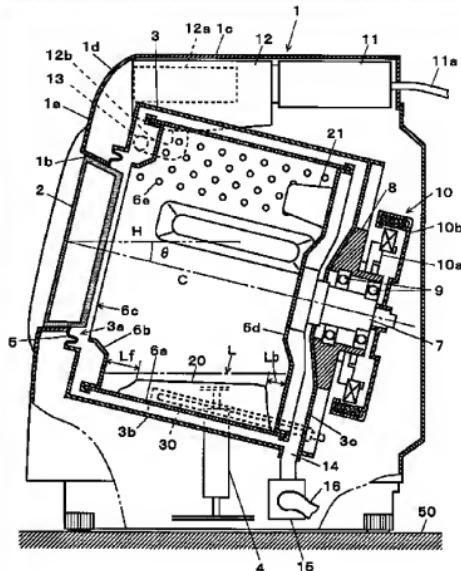
A bearing provided in this outer tub. An axis supported movably by this bearing enabling free rotation and a drum on which an end of said axis adhered to the rear end face by the shape of a cylindrical shape in a peripheral surface.

It is the drum type washing machine provided with the above, said drum was allocated in a front going-up inclination so that a front end surface might serve as a position higher than a rear end face, and a projection amount of a baffle projected and formed inside [peripheral surface] this drum was made larger than the front end surface side by the rear end face side.

[Claim 2] The drum type washing machine according to claim 1, wherein said baffle is formed so that a line of a cross direction which a field suitable for the axis side or a crowning accomplishes may become an abbreviated level, when it is in a pars basilaris osis occipitalis in said drum.

[Claim 3] The drum type washing machine according to

Drawing selection Representative draw



[Translation done.]

claim 1 or 2, wherein clearance of a front tip part of a field and a front end surface of a drum suitable for the axis side of said baffle is larger than clearance of a rear edge of a field and a rear end face of a drum suitable for the axis side of the baffle.

[Claim 4]The drum type washing machine according to any one of claims 1 to 3 forming an auxiliary baffle which projects ahead in a rear end face of said drum.

[Claim 5]The drum type washing machine according to claim 4 forming said auxiliary baffle in a position which is not in agreement with an attaching position of said baffle in a hoop direction of said drum.

[Claim 6]An outer packaging.

An outer tub installed in this outer packaging in order to store water.

A bearing provided in this outer tub, an axis supported movably by this bearing enabling free rotation, and a drum on which an end of said axis adhered to the rear end face by the shape of a cylindrical shape in a peripheral surface.

Are the above the drum type washing machine which it had, and said outer tub, A heater for the heat of hydration was allocated so that it had the peripheral surface by which the part was formed in a transverse direction by bulging by the pars-basilaris-ossis-occipitalis side of a cylinder body, and it might be a gap between a peripheral surface of this outer tub, and a peripheral surface of said drum and at least a part might start a swollen part of this outer tub.

[Claim 7]The drum type washing machine according to claim 6, wherein said outer tub bulges outside only at one side divided into two by a vertical plane containing an axis line of said cylinder body.

[Claim 8]A drum type washing machine allocating a heater for the heat of hydration in a range which comes under this water surface in a position characterized by comprising the following from which it separated from a vertical plane when it is a gap between this drum and said outer tub and is the lowest water level for wash of water stored in this outer tub.

An outer packaging.

An outer tub installed in this outer packaging in order to store water.

A bearing provided in this outer tub.

In a drum type washing machine which an axis supported movably by this bearing enabling free rotation and a peripheral surface are provided with a drum on which an end of said axis adhered to the rear end face by the shape of a cylindrical shape, and is allocated in a front going-up inclination and changes so that said drum may serve as a position in which a front end surface is higher than a rear

end face, it is an axis line of said drum.

[Claim 9]An outer packaging, an outer tub installed in this outer packaging in order to store water, and a bearing provided in this outer tub, An axis supported movably by this bearing enabling free rotation and a drum on which an end of said axis adhered to the rear end face by the shape of a cylindrical shape in a peripheral surface, In a drum type washing machine which is allocated in a front going-up inclination and changes so that a preparation and said drum may serve as a position in which a front end surface is higher than a rear end face, A drum type washing machine allocating a heater for the heat of hydration in a range which comes under this water surface when it is a gap between a rear end face of said drum, and the rear of said outer tub which meets this and is the lowest water level for wash of water stored in an outer tub.

[Translation done.]

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[JP,2002-315985,A]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

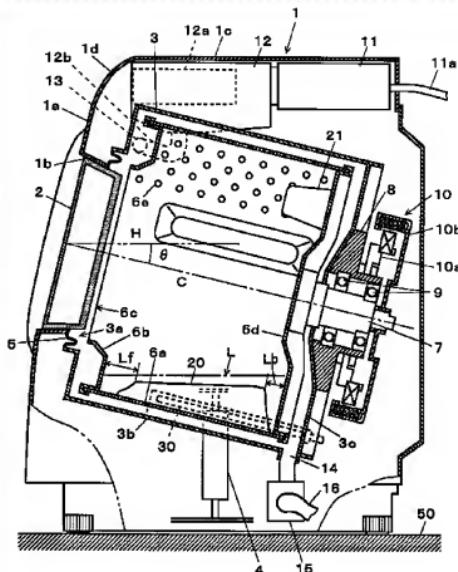
[Field of the Invention] This invention relates to the drum type washing machine which has a drum which rotates focusing on a horizontal axis or an axis of tilt. In many cases although the drum type washing machine can generally perform from wash to desiccation continuously, the drum type washing machine said here may be what cannot dry. [0002]

[Description of the Prior Art] Conventionally, the drum type washing machine is provided with the composition which has arranged the cylinder basket-like drum in an outer tub focusing on a level axis enabling free rotation.

The washing accommodated in the drum is struck and washed by rotating a drum, where water is stored in an outer tub.

In order to take the washing in and out in the drum of such a drum type washing machine, the door of the horizontal difference type provided in the front panel of the washing machine needed to be opened, and the impossible posture which the user stooped down or bent the waist needed to be

Drawing selection Representative draw



[Translation done.]

taken in the usual installation condition. On the other hand, the drum type washing machine of composition of having turned to the slanting upper part, having inclined and having arranged the anterior part of a drum is marketed so that the washing can be taken in and out with the recent years more impossible posture which is not.

[0003]

[Problem(s) to be Solved by the Invention] Thus, in the washing machine which has leaned and arranged the drum, if I am [washing operation] easy too much and the drum is rotated comparatively slowly at the time of operation and also drying operation, the washing tends to incline toward the inclination lower part, i.e., the back of drum, side with gravity. However, in the drum type washing machine of the conventional composition, consideration is not made [as opposed to / especially / the deviation of such a washing], and a lot of partial washings cannot fully be stirred, but there is a possibility that washings and rinse run short, or it may wash and unevenness may occur.

[0004] There are some which warm the water stored in the outer tub to the conventional drum type washing machine, and improved cleaning performance, therefore the peripheral surface hollowed the maximum pars basilaris ossis occipitalis of the outer tub of cylindrical shape, and the heater is accommodated there. However, since securing more than predetermined is defined on safety, only the part needs to provide an outer tub in a high position within an outer packaging, and the interval between such a heater and a floor line has the problem that the height of the outer packaging of a washing machine becomes high.

[0005] The place which accomplishes this invention in order to solve such SUBJECT, and is made into the 1st purpose, It is in providing the drum type washing machine by the deviation of the washing which is easy to wash too much and can avoid the fall of performance in the drum type washing machine which has the composition which carried out the front going-up inclination and has arranged the drum.

[0006] In the washing machine which has the composition which carried out the front going-up inclination and has arranged the drum, there is especially a place made into the 2nd purpose of this invention in providing the drum type washing machine which can stop the height of an outside by devising arrangement and shape of the heater for warming the water stored in the outer tub.

[0007]

[The means for solving a technical problem and an effect] The 1st invention accomplished in order to solve an aforementioned problem, In the drum type washing machine with which an outer tub, the bearing provided in this outer

tub, the axis supported movably by this bearing enabling free rotation, and a peripheral surface are provided with the drum on which the end of said axis adhered to the rear end face by the shape of a cylindrical shape, It is characterized by said drum making the projection amount of the baffle which it was allocated in the front going-up inclination so that a front end surface might serve as a position higher than a rear end face, and was projected and formed inside [peripheral surface] this drum larger than the front end surface side by the rear end face side.

[0008]As one mode of this 1st invention, said baffle can be considered as composition formed so that a line of a cross direction which a field suitable for the axis side or a crowning accomplishes might become an abbreviated level, when it is in a pars basilaris ossis occipitalis in said drum.

[0009]Since it is leaned and arranged according to the drum type washing machine concerning the 1st invention so that a drum may lower-incline toward the rear end face side from the front end surface side, if I am [washing] easy too much or this drum is comparatively rotated around an axis at a low speed for desiccation, The washing accommodated in a drum moves gradually along an inclination, and inclines toward the rear end face side. Since a projection amount of a baffle is large at the rear-face side of a drum, even if a lot of washings focus, the baffle can lift these washing up with rotation of a drum, and can stir the whole washing moderately. By this, it can be easy to wash too much, or shortage of desiccation and unevenness can decrease, and high washing performance, rinse performance, or drying performance can be secured.

[0010]In a drum type washing machine concerning the 1st invention, since the projection amount of a baffle is small at the front end surface side of a drum, when a user takes the washing in and out through a clothing injection opening provided in a front end surface of a drum, a baffle is effective in not becoming obstructive but receipts and payments of the washing becoming easy.

[0011]Since a projection amount of a baffle is small again by the drum front end surface side whose quantity of the washing decreases relatively as mentioned above, there is a subordinate effect that a touch area of the washing and a baffle is small in this portion, and there are few cloth bruises of the washing.

[0012]As for clearance of a front tip part of a field and a front end surface of a drum it turns [front end surface] to the axis side of a baffle in a drum type washing machine concerning the 1st invention of the above, it is preferred to make it larger than clearance of a rear edge of a field and a rear end face of a drum suitable for the axis side of the baffle. While according to this composition the washing

should not be easily caught in a crevice between a rear edge of a field and a rear end face of a drum suitable for the axis side of a baffle and being able to ensure stirring of the washing, also when taking out the washing, it is easy to take out, and a cloth bruise of the washing can also be reduced.

[0013]When it has composition which forms again an auxiliary baffle which projects ahead in a rear end face of a drum other than the above-mentioned baffle established in the drum peripheral surface inside, it is much more desirable. According to this composition, there is much quantity of the washing accommodated in a drum, only with a baffle formed in a peripheral surface, even if it is a case where the washing cannot fully be stirred, the washing is certainly stirred using an auxiliary baffle, I am [washing unevenness] easy too much, and unevenness or the drying mark can be canceled.

[0014]This auxiliary baffle can heighten the stirring effect further, if it provides in a position which is not in agreement with an attaching position of the above-mentioned baffle in a hoop direction of a drum.

[0015]The 2nd invention accomplished in order to solve an aforementioned problem, An outer packaging, an outer tub installed in this outer packaging in order to store water, and a bearing provided in this outer tub, In a drum type washing machine with which an axis supported movably by this bearing enabling free rotation and a peripheral surface are provided with a drum on which an end of said axis adhered to the rear end face by the shape of a cylindrical shape, said outer tub, It has the peripheral surface by which the part was formed in a transverse direction by bulging by the pars-basilaris-ossis-occipitalis side of a cylinder body, and it is a gap between a peripheral surface of this outer tub, and a peripheral surface of said drum, and is characterized by allocating a heater for the heat of hydration so that at least a part may start a swollen part of this outer tub.

[0016]Since it is located above that a portion which bulged outside from a cylinder body which constitutes a peripheral surface of an outer tub in an outer packaging is the same as that of the maximum pars basilaris ossis occipitalis of that cylinder body, or it according to the drum type washing machine concerning this 2nd invention, it is arranged above that a heater is also the same as that of the maximum pars basilaris ossis occipitalis of a cylinder body, or it. Therefore, in order to maintain an interval of a floor line and a heater beyond prescribed distance, it becomes unnecessary to arrange an outer tub especially highly, and height of an outer packaging of a washing machine can be stopped. With this composition, not a curved surface but, for example since it is planate, it is stabilized and a pars basilaris ossis occipitalis of an outer tub can be attached in an outer

packaging.

[0017]In a drum type washing machine concerning the 2nd invention of the above, a swollen part of an outer tub will store so much water, and amount of water for attaining the same water level will increase it. Then, as for an outer tub, in order to stop an amount of consumption of useless water, it is preferred to have composition which bulged outside only at one side divided into two by a vertical plane containing an axis line of the above-mentioned cylinder body.

[0018]The 3rd invention accomplished in order to solve an aforementioned problem. An outer packaging, an outer tub installed in this outer packaging in order to store water, and a bearing provided in this outer tub, An axis supported movably by this bearing enabling free rotation and a drum on which an end of said axis adhered to the rear end face by the shape of a cylindrical shape in a peripheral surface, A preparation and said drum in a position from which it separated from a vertical plane containing an axis line of said drum in a drum type washing machine which is allocated in a front going-up inclination and changes so that a front end surface may serve as a position higher than a rear end face. When it is a gap between this drum and said outer tub and is the lowest water level for wash of water stored in this outer tub, it is characterized by allocating a heater for the heat of hydration in a range which comes under this water surface.

[0019]Namely, in a drum type washing machine concerning this 3rd invention. A heater is not accommodated in a hollow formed in the maximum pars basilaris ossis occipitalis of an outer tub which is in a vertical plane which contains an axis line of a drum like the conventional drum type washing machine, It is the position removed in the direction of either right or left from the position, and a heater is allocated in a range which is the lowest water level for wash of water which is the same as that of the maximum pars basilaris ossis occipitalis of an outer tub, or is moreover stored in an outer tub above it and which comes under the water surface but. Therefore, in order to maintain an interval of a floor line and a heater beyond prescribed distance, it becomes unnecessary to arrange an outer tub especially highly, and height of an outer packaging of a washing machine can be stopped like the 2nd invention of the above.

[0020]The 4th invention accomplished in order to solve an aforementioned problem. An outer packaging, an outer tub installed in this outer packaging in order to store water, and a bearing provided in this outer tub, An axis supported movably by this bearing enabling free rotation and a drum on which an end of said axis adhered to the rear end face by the shape of a cylindrical shape in a peripheral surface, In a

drum type washing machine which is allocated in a front going-up inclination and changes so that a preparation and said drum may serve as a position in which a front end surface is higher than a rear end face, When it is a gap between a rear end face of said drum, and the rear of said outer tub which meets this and is the lowest water level for wash of water stored in an outer tub, it is characterized by allocating a heater for the heat of hydration in a range which comes under this water surface.

[0021]In a drum type washing machine concerning this 4th invention, a heater is not installed in a gap between a peripheral surface of a drum, and a peripheral surface of an outer tub, but a heater is installed in a gap between a rear end face of a drum, and the rear of an outer tub which meets this. Therefore, in order to avoid contact with a heater and a drum, only the part does not need to extend a peripheral surface of an outer tub. Since it is easy to secure an interval between a heater and a floor line even if it does not separate the maximum pars basilaris ossis occipitalis of an outer tub from a floor line, height of an outer packaging can be low stopped like the 2nd and 3rd invention of the above.

[0022]

[Embodiment of the Invention]Hereafter, the drum type washing machine which is one example of the 1st - the 3rd invention is explained with reference to drawings. Side drawing of longitudinal section and drawing 2 which drawing 1 shows the entire configuration of the drum type washing machine of this example (henceforth "the 1st example") are transverse-plane drawing of longitudinal section of the important section of this drum type washing machine.

[0023]The outer packaging 1 which constitutes the outside of this drum type washing machine has the front part 1a which turned to the slanting upper part, the approximate circle-shaped clothes input port 1b is formed in that front part 1a, and the door 2 of the horizontal difference type which can look at an inside through a fluoroscope is formed there. The upper part of the front part 1a of the outer packaging 1 follows the upper face part 1c, curving back, and the withdrawal detergent container 12a is formed the navigational panel which is not illustrated to this curved surface part 1d, and ahead.

[0024]Inside the outer packaging 1, the peripheral surface is moderately held with the damper 4 with which the cylindrical shape-like (however, the part bulges like the after-mentioned) outer tub 3 supports the method of the right-and-left both bottom, and the spring which tow the upper part and which is not illustrated, enabling free rocking. The front part of the outer tub 3 faces the clothes input port 1b of the outer packaging 1, the opening is carried

out to the circle configuration, and this opening 3a and clothes input port 1b are connected by the sealing member 5 which comprises elastic bodies, such as rubber.

[0025]Inside the outer tub 3, the drum 6 of the shape of a peripheral surface cylindrical shape for accommodating the washing is supported pivotally with the principal axis 7. Namely, the drum section 6a of the cylindrical shape to which the drum 6 punched many water flow holes 6e, The front plate 6b which has the circular opening 6c for a clothing injection, and the back plate 6d are comprised, and after being joined by caulking by the flange projected and formed in the front tip part and the rear edge, respectively, the screw stop of the drum section 6a, the front plate 6b, and the drum section 6a and the back plate 6d is carried out. It is firmly fixed to the rear of the back plate 6d of the drum 6, and the end of the principal axis 7 is supported movably by the bearing 9 of the bearing holdown member 8 with which the rear surface portion of the outer tub 3 was equipped, enabling free rotation.

[0026]The rotor 10b of the motor 10 which is an outer rotor type DC brushless motor is attached to the end of the principal axis 7 projected behind the rear surface portion 3c of the outer tub 3, and, on the other hand, the stator 10a of the motor 10 is being fixed to the bearing holdown member 8. The rotor 10b containing a permanent magnet is arranged so that the periphery side of the stator 10a containing winding may be surrounded, and thereby, the motor 10 has a thin structure in the extension direction of the principal axis 7. If driving current is supplied to the stator 10a from the control circuit which is not illustrated, it will rotate and the drum 6 will rotate the rotor 10b with the same revolving speed as the rotor 10b via the principal axis 7.

[0027]The outer tub 3 which carried out the inner package of the drum 6 is arranged as it is also in a front going-up inclination, so that only the angle theta which the axis line C of the drum 6 (it is in agreement with the axis line of the principal axis 7) defines beforehand to the horizon H may incline, so that clearly [drawing 1]. The angle of gradient theta is set as about 5-30 degrees here. Although the inclination of the front part 1a of the outer packaging 1 is formed according to the inclination of this outer tub 3 and the drum 6, it is not necessary to be necessarily an identical angle.

[0028]The water supply part 11 containing a feed water valve, the pump for bath water feed water, etc. is allocated in the upper space in the outer packaging 1, and the bath water water supply hose (not shown) etc. which result in the waterworks water supply hose 11a which reaches an external hydrant, the organ bath of a bath, etc. are connected with this water supply part 11, enabling free attachment and

detachment. The water which the detergent throwing part 12 which makes free the inner package of the drawer of the above-mentioned detergent container 12a is formed ahead [of the water supply part 11], and was supplied to the detergent throwing part 12 from the water supply part 11, It lets the injector pipe 12b connected to the pars basilaris ossis occipitalis of the detergent throwing part 12 pass, and is supplied into the outer tub 3 from the filling port 13 provided ahead of the outer tub 3. The fabric softener etc. which powder detergent and liquid detergent which were beforehand accommodated in the detergent container 12a at that time when it was, for example at the feed water time of washing distance flowed into water, and were supplied into the outer tub 3, for example, were beforehand accommodated in the detergent container 12a when it was at the feed water time of the last rinse distance flow into water, and are supplied into the outer tub 3.

[0029]If feed water is performed into the outer tub 3 from the water supply part 11 and it stores in the outer tub 3, this water will flow into the drum 6 through the water flow hole 6e. The water breathed out from the washing within the drum 6 at the time of drying disperses to the outer tub 3 side through the water flow hole 6e. The exhaust port 14 is formed behind [pars-basilaris-ossis-occipitalis] the outer tub 3, the exhaust port 14 is connected to the input of the sewer valve 15, and if the sewer valve 15 is opened wide, the water currently stored in the outer tub 3 will be discharged through the drainage pipe 16 outside the plane.

[0030]Maintain angle of rotation of 120 degrees at the circumference of the principal axis 7 at the inner circumference side of the drum section 6a of the drum 6, they are formed by the three main baffles 20, and the main baffle 20, It is formed in shape highly low at the front-face side by the rear-face side of the drum 6 so that the top panel may be in an abbreviated horizontal state (that is, it is parallel to the horizon H like), when located in the pars basilaris ossis occipitalis in the drum 6. Although the front tip side and back edge surface of the main baffle 20 have become aslant, respectively, the distance Lf and Lb between the corner of the top panel, the front plate 6b of the drum 6, and the back plate 6d is large (that is, $Lf > Lb$) at the front face side [side / rear-face], as shown in drawing 1. Inside the back plate 6d of the drum 6, the auxiliary baffle 21 which projects ahead is formed in the middle rotary place (that is, about 60-degree angular position) of the main baffle 20 which adjoins exactly again. An operation of such a main baffle 20 and the auxiliary baffle 21 is mentioned later.

[0031]As shown in drawing 2, although the side periphery side of the outer tub 3 is cylindrical shape as the whole, with this drum type washing machine, it has shape in which the

lower right part bulged outside from the circle (circle shown by A in drawing 2) centering on the axis line C, and the pars basilaris ossis occipitalis was formed planate exactly. The heater 30 which is a sheath heater for heating water is allocated in the bulged part 3d of this outer tub 3.

[0032]Drawing 3 is a detail view showing the mounting structure of this heater, (a) is a plan and (b) is a side view. The heater supporter 31 is fixed to the non-exothermic part 30a of the root of the approximately U type-like heater 30, and the tip part is held with the holder 32. The heater supporter 31 is fixed to the rear surface portion 3c of the outer tub 3 via the sealing member which has watertightness, and the heater 30 inclines almost in parallel with the pars basilaris ossis occipitalis of the outer tub 3, and is allocated.

[0033]The water which is a grade by which I am easy too much and the heater 30 whole is soaked at least in the outer tub 3 at the time of operation as for washing operation is stored, and heating current is supplied to the heater 30 from the exterior. Effects, like the dirt omission in which the stored water is warm-water-ized by this and the dissolution of a detergent is promoted becomes good can be acquired.

[0034]Conventionally, in order that the position of the heater 30 may secure safety, the minimum value of the clearance from the floor line 50 is decided. Since the heater 30 comes to a position higher than the maximum pars basilaris ossis occipitalis of the outer tub 3 like this drum type washing machine when the heater 30 is installed in the bulged part 3d of the outer tub 3, As it mentioned above into the portion hollow one more step rather than the maximum pars basilaris ossis occipitalis of the outer tub 3 like before unlike the case where a heater is formed, in order to secure the clearance of the heater 30 and the floor line 50, it becomes unnecessary to pad the outer tub 3 whole.

Therefore, the overall height of a washing machine can be made low, the headroom of a washing machine feels it refreshed, and effective use is possible. Since the bulged part 3d bottom of the outer tub 3 becomes flat, it is stabilized and the outer tub 3 can be fixed on the outer tub stationary plate 17.

[0035]subsequently, washing operation in this drum type washing machine -- it is too cheap and an operation of the above-mentioned main baffle 20 at the time of operation and the auxiliary baffle 21 is explained.

[0036]Before a wash start, a user opens the door 2, and the washing is thrown in in the drum 6. In this drum type washing machine, since the opening 6c and the clothes input port 1b of the drum 6 have turned to the slanting upper part, even if a user does not take an impossible posture, he can accommodate the washing in the drum 6 easily. Even if a

user is ahead [in the drum 6] one-sided and accommodates the washing at this time, when washing operation is started and the drum 6 rotates, the washing in the drum 6 moves to the back side gradually along an inclination, and is in the tendency concentrated on the rear in the drum 6. Namely, I am [washing operation] easy too much, and much [the number] washing to the back side which has few washing inclines by the front sides of the drum 6 at the time of operation (at the time [Further] of drying operation).

[0037]Since the height from the inner surface of the drum section 6a is large by the rear side, the main baffle 20 can run its drum type washing machine of this through more its washing in the upper part by the rear side. That is, as mentioned above, even when much washing has moved to the back side of the drum 6, these washing can fully be stirred, I am [washing unevenness] easy too much, and unevenness, the drying mark, etc. can be abolished.

Although the washing partial so that it might stick to the back plate 6d of the drum 6 is hard to stir depending on the main baffle 20, it stirs certainly with the auxiliary baffle 21 ahead projected from the back plate 6d. Therefore, the whole washing accommodated in the drum 6 is fully stirred, I am [washing unevenness] easy too much, and unevenness, the drying mark, etc. can be abolished.

[0038]Since the main baffle 20 is low in the front sides in the drum 6, also when taking the washing in and out of the clothes input port 1b, the main baffle 20 does not become obstructive. Since the distance Lf in the front sides of the drum 6 is larger than the distance Lb by the side of back, when the washing cannot go into this crevice easily, therefore the washing is taken out, by the back side, the time and effort which takes out the washing caught in this crevice can be reduced.

[0039]Thus, in the drum type washing machine of the 1st example, a user can be presented with the ease of using with high performance. As stated previously, the height of a washing machine is stopped and upper space can be used widely, and also it becomes possible to install without a place with a window also hiding a window in the upper part.

[0040]Subsequently, drawing 4 and drawing 5 explain one example (henceforth "the 2nd example") of the drum type washing machine concerning the 4th invention. The same numerals are given to a portion the same as that of the 1st example of the above, or considerable, and explanation is omitted unless explanation in particular is required.

[0041]In this drum type washing machine, the outer tub 3 does not have a bulged part, but that peripheral surface serves as nearly perfect cylindrical shape. Different points from the 1st example of the above are the shape of the heater 40, and its installed position. That is, the heater 40 for

heating water has arc shape, as shown in drawing 5, and where the root is held at the pars basilaris ossis occipitalis of the outer tub 3, it is set up along with the rear surface portion 3c of the outer tub 3. He is trying for the topmost part of the heater 40 to become certainly lower than the minimum water level L that is [washing operation] easy too much and is set up in the outer tub 3 (that is, drum 6) at the time of operation also in this case.

[0042]Also by composition of this 2nd example, since the heater 40 comes to a position higher than the maximum pars basilaris ossis occipitalis of the outer tub 3, In order to secure the clearance of the heater 40 and the floor line 50 from the maximum pars basilaris ossis occipitalis of the outer tub 3 like before to the portion hollow one more step unlike the case where a heater is formed, it becomes unnecessary to pad the outer tub 3 whole. Therefore, the overall height of a washing machine can be made low, the headroom of a washing machine feels it refreshed, and effective use is possible. In this composition, there is little quantity of the water which does not need to form the bulged part 3d in the outer tub 3 like the 1st example, is easy to wash only that part too much, and is sometimes stored at the outer tub 3, and it ends. Of course, since it is stabilized and the outer tub 3 is fixed on the outer tub stationary plate 17, a bulged part may be provided.

[0043]Each above-mentioned example is an example of this invention, and it is clear that change and correction can be suitably made in the range of the meaning of this invention.

[Translation done.]